

1955 3

IK-1

doc. 466

UNITED STATES
DEPARTMENT OF THE INTERIOR

DI-6

APPROVED DECEMBER 1941

Inyan Kara study

Crook Co

Locality W-1, partial Skull Cr. section	1
Locality W-2, " " " " " "	3
Locality W-3 Gov't Canyon section (part)	4 7427
Locality W-1, Skull Cr into Fall River top	13
Locality W-3 Gov't Canyon section (cont.)	16
Locality W-4 Fall River-S.C. contact zone	24
Locality W-2 continuation S.C. section	25
Locality W-2 Top Fall River	28
Resume on Gov't Canyon area	30
Locality W-5, Skull Cr. NW New Haven	31 7427
Locality W-6, Mount Butte section	37 7427 7427
Locality W-7, Aladdin area, Lk. & F.R.	43
Locality W-8, Aladdin area - Lk. - Morrison	48
Locality W-9, Aladdin area - Lk. - (Four corners Rd + III)	54
Locality W-10, Arch Creek - Lk. - F.R.	59
Locality W-11, Inyan Kara Cr. #1, Redwater to F.R.	72 7427
Notes on Inyan Kara Cr. #2 (Robinson Threshold Ser.)	75
W-12 (continued IK Nth Cr #2)	



12.0

hatched 45 y. old. 100%
 (air) 100% 100% with 100%
 info. 100% 100% 100% 100%
 weather 100% 100% 100% 100%
 conditions 100% 100% 100% 100%

Also 5.0 5.0 top 5.0 5.0
 5.0 5.0 5.0 5.0 5.0 5.0
 5.0 5.0 5.0 5.0 5.0 5.0

Small head 100%

Unwashed 100% of upper
 100% 100% 100% 100%
 plan. (Spot sample #1, just
 over 3000.)

0.7

Subsiding 100% 100% 100%
 100% 100% 100% 100%
 brown.

10.0+

Info. 100% 100% 100% 100%
 100% 100% 100% 100%
 (Spot sample #2 of lower 100%)

Book Co.



Locality W-2. The distance from top of Fall River to base of Laramie unit in preceding section. Locality #1, 916 of which is at base of Laramie unit.

Shale here rests on interbedded limestone to interbedded sandstone.

Up dip bedded sandstone is present. Shale is thin with chert & thin layers of sandstone. Locality #1 in sec. p. 25

Locality is about 1 1/4 miles N. of W-1 along same road. Local bedlands in Skull Creek visible across gulch in top Fall River on W side road.

Devils Tower 1 SE Quad, cont., W 1/4 SW 1/4, sec. 6, T56N, R. 64W, and due west into R. Sec. 1, R. 65W,



Government Canyon Section.

Part 1. From base silt ss down into
red claystones

Base silt ss

3.4 Claystone, light gray to brown
bentonitic in upper foot, fine
dotted, thin, pinkish tan
claystone to light gray, green
claystone with red mottling.

9.0 Claystone, hard red, brownish
silty claystone. Has some
fine, brownish or brick red to
dark red.

20.0 Claystone, silty, red, grading
to clayey siltstone, purplish
red below. Locally at top
are lenticular bodies of
white porcelain to up to
1.0 foot diameter. About
4' below top, claystone
and siltstone
Some non-calcareous



scattered in lower part
110+ claystone. some green.

On up gully toward cliffs, minor
changes take place in color. In
this part of section, bedded
upper greenish clay. As the
clay is so hard toward the
cliffs.

Part 2. Measuring up from base of
locality of Part 1.

1610± Sandstone clayey sandstone, and
some claystone. Chiefly soft, friable,
weathering to whitish lumps. Bed
1.5 locally craves to conglomerate
structure, weathering to
tan or shaly. Locally other
materials, like white. sand.
About 4' from top of thin bedded
sandstone locally with bed of
chert, in thin layers. Top of
sand gravelly into sandy
claystone above, which is well
gray, but the lower part
stained.



Thruout this interval polished
 chert pebbles weathering out.
 From 1/2' up to 6' long some
 subangular. Tend to occur in
 numbers locally then sparse
 Seen in place in both chert
 and sandstone

Many more in the sandstone on west
 cross

16.0 Clayey gray to light gray
 some carb. r. in some
 some F. spl.

7.0 Crs. silty clay, claystone
 probably local (gray)
 some fossiliferous (p. 11)

7.0± Silty clay, local some
 pebbles
 sandstone.

0.5-1.0 Coralline chert (top)

Part 3. Start in red sand base at
 pin. 20 ft, at bottom of stream

15.0-? Silty clay, local, variegated
 purple and green - rare
 some fossiliferous (p. 11)
 massive - 8' or more



Upper 2± feet hard silty
claystone, and sand gray.

9.5 Claystone, green, sandy, fine
mottling in lower part.
Brownish from about 2.5
feet down, fine sandstone at
base. Lighter & silty at
top and greenish gray. Silty
claystone to sandstone.

3.0 Claystone, sandy, light
gray to green, white with
greenish sand locally.

3.4 Sandstone, thin, clay-
finer, sandy, yellow-
weathered, hard, light
about 1 foot to 2 feet
sandy, light brown, silty.
layers of calc.
sandstone, thin, light brown
color, no calc. no pol.
chert nodules.

2.2 Claystone, sandy, light
claystone-sandstone, light
white, sandy, and
silty, thin, light brown.

pois. pebbles here and
seen in place in immediate
vicinity

6.05 Clay, silty, gray to dark gray.
Lower 2' thin, silty
and sandy, some sparse
fossils, mostly small shelled
Platystrophia, small crust
nuggets, fresh silt, seen
locally, less of heavy clay, comp.
usual, no det. Fossils below
6' lump clay at base of unit.

10.6 Clay, silty, dark gray to gray
on surface, lumpy, crust on
slope. Upper part silty to
shaly. Scattered small fossils.

5.0 Clay, silty, tough, hard at
gray, silty, some small
light green, yellowish.
Scattered fossils, mostly
isolated by chert from
bed, close to soft shale.
Lower 3 ft clay, silty, 1' of
light gray

1.0+

2-3 m. soft, sandy, silty
or silty sand. Top of layer
less sandy, grad. into
sandy clay. 5-10 ft.
thick, dipping east, 10-15°.
faintly bedded.

4.4

2-3 m. (brown) clay, silty
to silty clay. Local
gray, calc. nodules?
w. thin yellowish to
reddish brown mottling.
bedding to 10-15° N. or
round base of bed
in upper 1/2.

L. 100

←→

feature

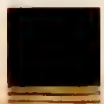
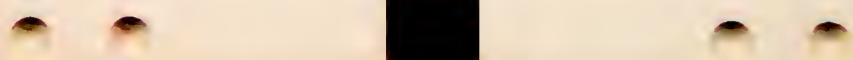
1.3

2-3 m. (brown) clay, silty
to silty clay. Local
sandy, silty, silty clay
nodules, sandy clay
to silty sand. Local
thinly bedded, dipping
10-15° N. or
10-15° S. or
10-15° E. or
10-15° W.

5.0

2-3 m. silty, sandy
locally sandy clay. Locally
reddish brown. 10-15°.

Handwritten text at the top edge, possibly a title or page number, partially obscured by a clip.



3.2+ Sands on, fine grained
low yellowish gray, cere
frag. in core, less in
beds 1 to 2' broken
interbeds gray clay
siltstone, carb. frags.

114 Silt, gray, fine grained
frag. in core, less in
part. (sample 3, 114)

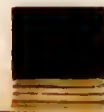
113 Clay, top F. bed, hard,

416 Silt + sand, well sorted
fine grained silt, clay
clay, Fe impreg., 0.1
Fe zone, 1/2" thick
and some thin beds
Fe zone per. in core
in core top, 1/2" thick
siltstone to gray
fine grained clay.

116 Interbedded fine gr
s. + siltstone, with
Fe impreg., 0.1 to
0.3 thick, 2' thick
locally prominent

This section continued on p. 16

Handwritten text at the top of the page, possibly a title or header, which is partially obscured by a metal clip.



Handwritten text on a yellowed page, likely a flyleaf or endpaper, featuring a large, stylized initial 'H' and some illegible script.

aprox. to $e = 511 + 5$

1. 10' of gray to black ss. with clay
 2. 10' of black ss. with clay
 3. 10' of black ss. with clay
 4. 10' of black ss. with clay
 5. 10' of black ss. with clay
 6. 10' of black ss. with clay
 7. 10' of black ss. with clay
 8. 10' of black ss. with clay
 9. 10' of black ss. with clay
 10. 10' of black ss. with clay

Handwritten text at the top edge, possibly a title or page number, partially obscured by a clip.



Leaving 2nd St. at
merges with 1st block.

40-? 5th St. in middle of
block 3rd St. in middle of
block 4th St.

3rd St. in middle of block.



Gov't Canyon section, cont'd from p. 12

1.1 Sandstone, fine, b.d., w.
crs. laminae, rippled
soft gray - upper 0.2.

7.0 Sandstone, fine, b.d., w.
lamin. to cross-bedded, thin-bedded,
b.d. 1-2 ft. red, open
some local, red chert.
Is. nodules, sandy sh. in
upper 0.5.

6.1 Shale, with some siltstone
beds, b.d.

2.8 Shale, gray, b.d., w.
siltstone, tested in upper

0.6 siltstone, b.d., w.
1.8 siltstone, b.d., w.
1.0 siltstone, b.d., w.

0.5 pink to red siltstone
becoming sandy at base.

3.4 Siltstone, sub gray, b.d., w.
siltstone, b.d., w.
siltstone, b.d., w.
0.5 siltstone, b.d., w.



, with thin interbedded clay
 silty clay. S. in the
 10' standard for dipping.
 Conc. for ledge oil + 6' for
 1.0 from top. Above this
 interbedded fine gr. silty
 coarse silty.

3.6 Sandstone, vertically cherty
 medium, soft, silty, S. in
 1.5 15' ~~as even~~
 bedding, "laminated"
 bedding planes, and the
 dipping 30' to 40' N. of
 vertical. weathering surface
 two layers, brownish, massive, hard
 silty. On top of lower layer
 is red crust.

1.1 Sandstone, thin to medium
 silty, weathering to a
 weathering surface, massive
 silty, S. in the dip.

0.4 0.2 Sandstone, thin, fine gr.
 8-12m. bed.

0.5 Shale, S. in, gray, 0.3' + 1/2'
 10' of flk low oil +



thin yellowish gray at base

0.8 Siltstone, gray, sandy, shaly to massive locally. Weathers gray white to light gray

2.0 Sandstone, fine gr, silty, irreg bedded. Frizzes, light buff weath, localized clayey. Has Fe impregnation, yellow to brown, thin crumbly parting "worm-worked" much weathering to silica.

2.5 Sandstone, fine gr, massive, basal 0.9 Fe impreg. weath. Fe brown, remainder weath. to light gray

4.5 Sandstone, fine-gr, ^{to med gr} locally fine gr, thin bedded. Partly sandy, sandy, some with silty part. Some sand beds transition to upper part

0.7 Interbedded sandstone & siltstone, dk gray to black. Coarse. Gravel to 1/2 in. size. Thin bedded, sandy siltstone.



1.3 Sandstone f. gr. ~~medium~~
medium to coarse brown to black
lenses by jointing. Weathers
yellow gray. Thin bedded
locally. Some of the beds
plenty above ground, others
buried.

2.1 Sandstone fine to medium
lenses thin bedded with
upper 0.5 in. of sandstone,
the rest is clay. Lower
0.5 in. of sandstone + 6.1
in. of clay. Some of the
sandstone is up to 10 in.
thick. The clay is
1/2 in. thick in some places
and is marked in some
places.

5.7 Limestone, calcareous sh., silty
silty sh., sandy sh., silty
silty sh., fine, local to
cr. sh. The sh. is in
contact with the sandstone.
Silty sh. to gray sh. to
brownish gray sh. to
black sh. to black sh.
to black sh. to black sh.
to black sh. to black sh.

17434 11512 21614

Locally more sandy in mid of part. On cliff face this interval commonly weathered with characteristic orange staining.

(#3)

10.6

Sandstone, fine to medium-grained, some massive sandstone, some silty sandstone. Silty zones and many fine-grained sandstone zones result in shaly weathering. HTS 3 or 4 inches, but 1' thick and beds in basal 1.5 to 2.0 ft. are impure. Bedding is full of wavy markings, ripples. Upper 1.1 ft. is very shaly with wavy bedding in part. Top of interval is marked by an orange stain.

1.0

Siltstone, gray, clayey with dark fine, locally silty sh.

2.2

Interbedded clayey siltstone + silty clay, gray and brownish to pink, and sandstone. Later in interval, 0.3 to 0.5 ft. at base. SS is laminar, 1/2 in. Also some sandstone.

This interval completed top p. 22 by mistake →

Handwritten text at the top edge, possibly a title or page number, partially obscured by a clip.



(#4)

15.0

Shale, gray, fine to med. grain, upper 7 to 10' is massive, x-lam, weathers to light gray, med. to coarse grained + 0.5' to 1' of clay shale. Lower 8-5' is clay shale to thin bedded in beds 0.5 to 2.0' thick, with some shaly ss. ptngs. to 1' or 2' thick, some fine grained, some med. grained.

3.1

Shale, carbonaceous, gray to black in upper foot grad to slick, carb. med. to coarse grained, silty, basal 0.2' is gray, fine grained, silty clay shale to 1' thick.

0.7

Shaly, light gray, silty with thin beds of impure, fine grained, ss. at top. Thin beds of ss. at top.

2.7

Shale, gray to light gray, med. to coarse grained, silty, some shaly ss. ptngs. to 1' or 2' thick, some fine grained, some med. grained.



Time below
bottom of
page 20.

worked Fe impregn. silts. 200 ft.
V. c. above 100 ft. - 100 ft.
Inter of chert. 10 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.

3.4. Interbedded gray silts. & sh.
Silty sh. Lenses of sandstone
11" - 1' 2" + 2" inter. from
100 ft. - 100 ft.

0.6 Lenses of siderite, Fe. 100 ft.
100 ft. 100 ft. 100 ft.

0.1 Sandstone, 100 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.

5.0 Shale, gray, 100 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.
Upper 2.0 in. silts. 100 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.

5.1 - 12 ft.
(locally 12 ft.)

100 ft. 100 ft. 100 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.
100 ft. 100 ft. 100 ft. 100 ft.

on but set gone with odd 1/2" of
pale green in the middle of 200'
ss. at 2' from sand top, 1/2" of
2' interval mostly ss. in the middle
and 1/2" of ss. Above this for 3'
was a lot of odd clay but thin,
interbedded ss + gray silt.

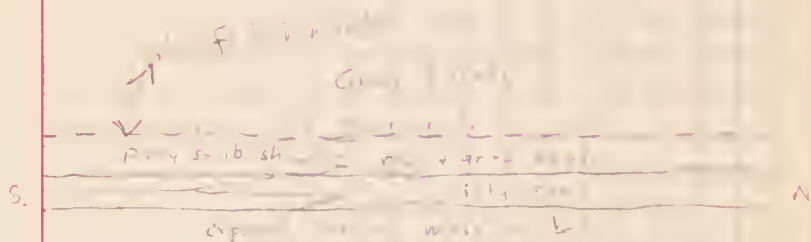


Locality W-4. Fall River - Sh. 11. r.

containing 2.11.

Reddish brown sandstone in zone, strata
in position of upper 12' of Fall River.
and the base of the Fall River.

Lower member part of section of
up super. Lower, base of Fall
crops to the surface. To north of
zone part of the river by road and
mineral of the lower zone.





Locality W-2

Continued section of shale creeps up
from the base of the sandstone. It
is on a small hill.

1.6 Bentonite



9.0' Shale, cherty dark gray & black
with a light gray zone at top,
brownish gray above. Brownish
silty in upper zone. 2nd
up. 0.5' is Fe-stained silty zone
= 2' Fe-stained silts in 1'.

Interval includes silty shale
concretions, some with branching.
One horizon about 1.0' above top
of silty zone has ripple
marks and fossiliferous.

(Sample - 2)

Above this some silty shale
shale (Sample - 3), horizontal
bedding, greenish blue from
oxidation near base.

13.0' Shale, gray, silty, fine grained
0.2' silty shale at top
At top is 0.3 to 0.5

Fe-stained silty shale with
ripples and concretions. At 0
just above base is
silty shale, blue-gray with
concretions and ripple
marks. Some in sandy
conc. near top of
lower part of the
unit.





W-2. From up ^H 5 30 - 214. 5
Fall P. on 6, down

Stall ch. bl. side 500

5.0 500 - 500 - 500 - 500 - 500
- 4 in. water, 500 ft. 100 ft.
+ 700 ft. 1000 ft. 1000 ft.
+ 1000 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.

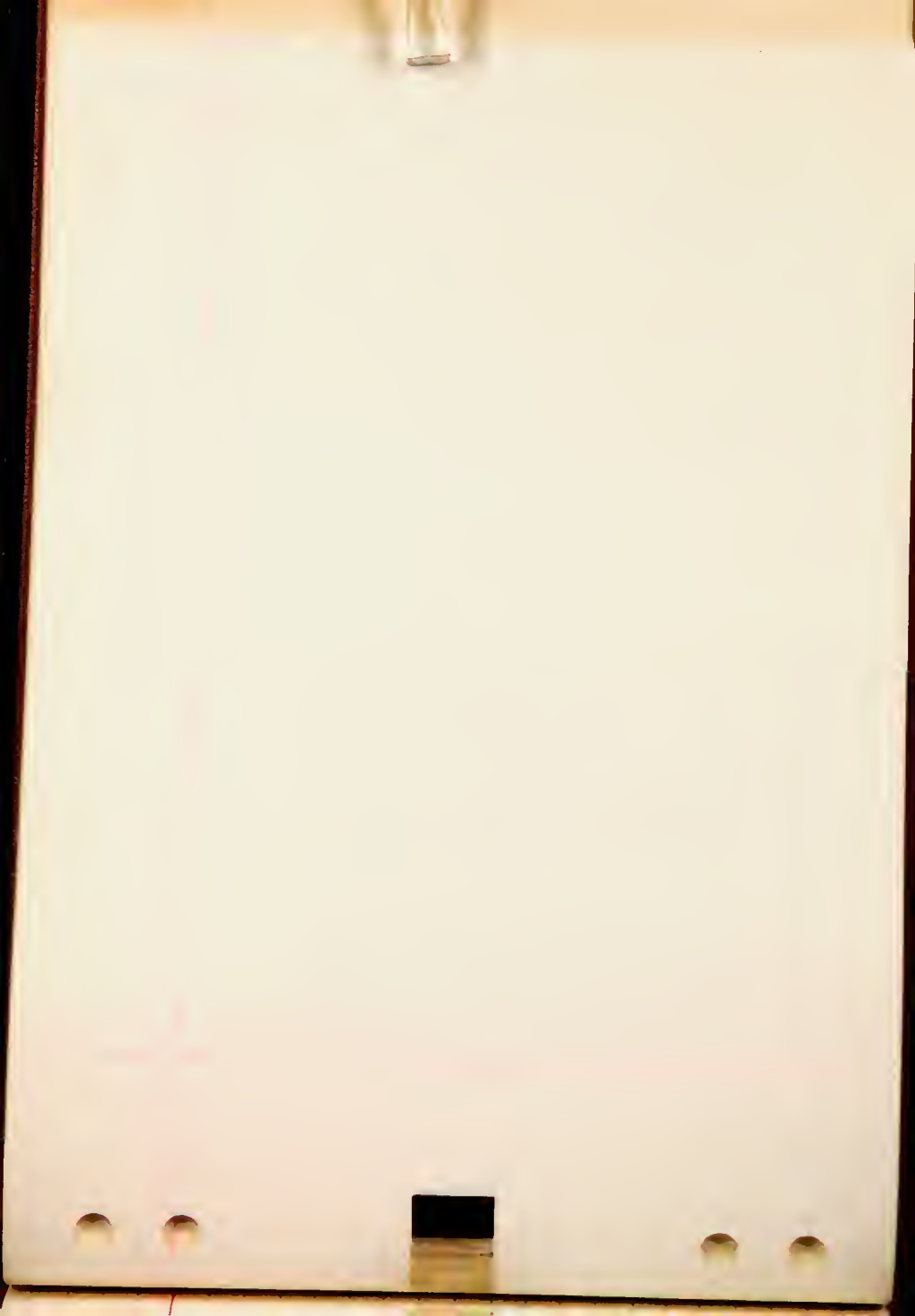
6.0 DA 500 ft. 1000 ft. 1000 ft.

2.0 500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.

3.0 500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.

3.0 500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.
500 ft. 1000 ft. 1000 ft.





Resume Gov't Canyon area.

Skull Cr. - Basal part has bentonite which may turn out to be good marker. Local abundance fish & reptile bones may not be typical over large area, but similar bones in Grulile quad - & Hot Springs S.D. (see spec.) also the plesiosaurs from N. Colo in this approx position.

Fall River - Locally much sandier than in most other parts of area, more evidence of burrowing organisms. The upper "variegated" zone doesn't seem to be evident here, nor ~~is~~ is shaly zone common above basal ss on Juyukore Cr. present.

Lakota. Believe only part of it is exposed & that red claystones basal part section are Lakota. Set up like that on Robinson-Theobald sect. - Juyukore Cr. with uppermost ss coming in, but here some gray clst between it & Fall R. contact.

Should get more info on cross cutting of massive ss near top Fall Riv.



[see iProfr.
287 Eichen Bull sec. 37]

7427

Locality W 5

Locality - S. on road

Is a very 2' deep layer of soil
from the surface.

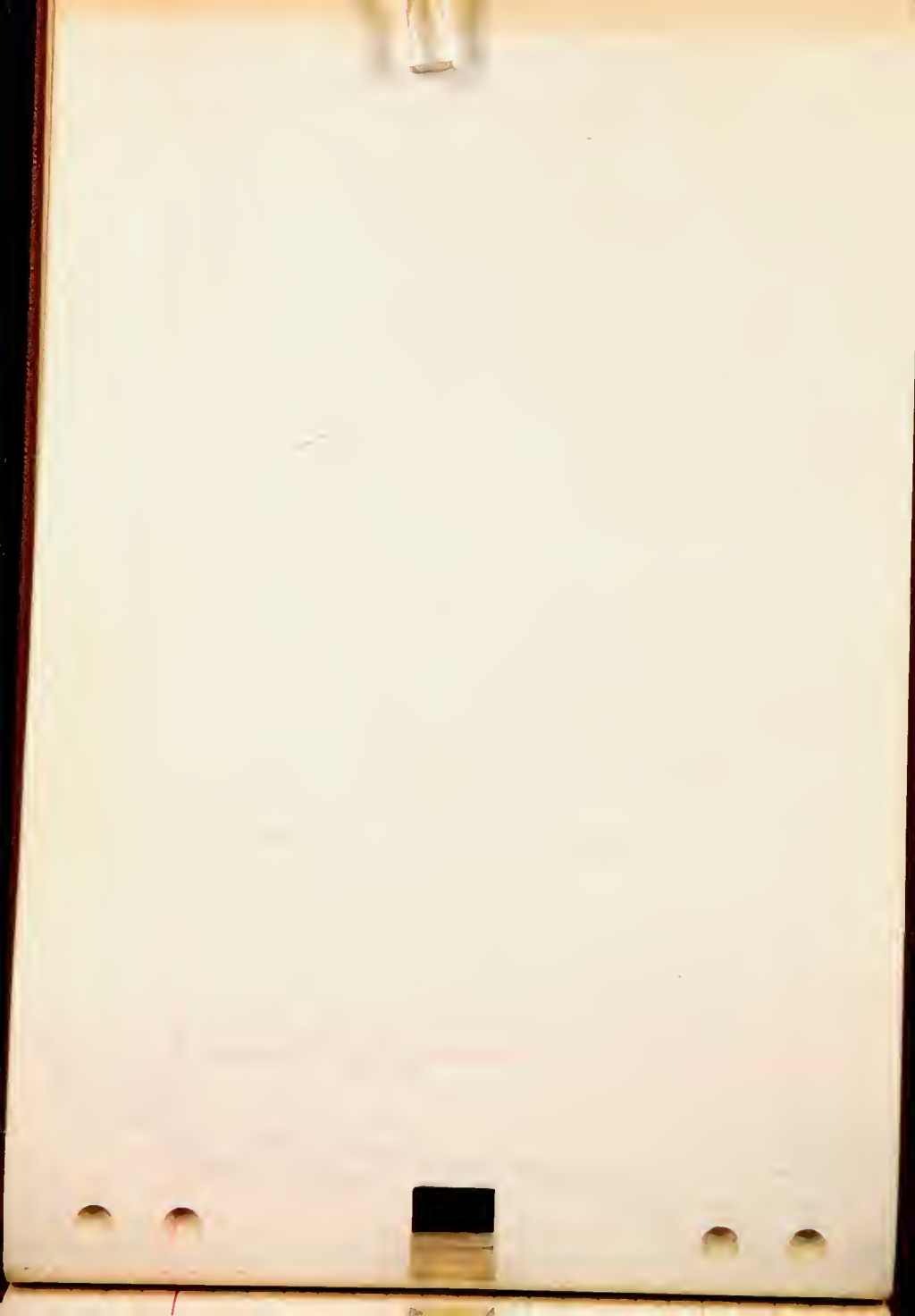
Neutral (top of mound)

3.0 Sandstone, red-brown
plenty of small pebbles
and large pebbles
to 1 inch, added.

4.3 Sandstone, red-brown
very fine.

4.5 Sandstone, red-brown
fine, very fine, and
slightly in upper part
fine, but not so fine
probably a transition
over to the sandstone
below.

14.0 Sandstone, fine gr. brown
and in large part
very fine, and
slightly coarse in the
12 feet thick bed
in the middle of the



are very fine, gray, pebbly.

3.6 Section in the middle of the
yellow clay, at a distance of
about 1/2 mile, weathered loc
+ much weathered material.
Locally the base 1 or 2
feet, grey brown weathered.
The clay is fairly much
celled but contains much

9.5 Clayey sand, sandy, brown
weathered gray. Locally
very sandy, also in some places
finer, brown, sandy, brown
from 4 to 6 feet thick.
At base is a thin layer of
finer, sandy, brown, fine sand
partly. Sand occurs in
the lower part of the section
locally bl. sand in the top
whole of the section. Sand,
Brown, but locally very dark,
Oxide of iron, brown, etc.
Oxidized.

7.1 Clayey sand, sandy, brown.
In the top + middle of the
section, brown, sandy, brown.



Upper pellic
zone

12.1

Gray ss with some platy
bedding, Benthid fossils
of the upper pellic - (Sample 11)

Shale, blue-gray, fine grained.

10' to 12' thick, probably about

2' thick, sample from upper

part of lower zone. Upper

part of zone is about 10' thick

and is about 10' thick, sample

from upper part of zone is

about 10' thick, sample from

lower part of zone is about

10' thick, sample from

5.1

Shale, blue-gray, fine grained.

with some small fossils, coarse

with small C.E. - (Sample 12)

2' top.

(Sample 12, 13, 14, 15)

2.4

Shale, blue-gray, fine grained. A1

to 10' thick, sample from

of the zone is about 10' thick

For 491 - coarse and pellet zone

which is sparingly fossiliferous.

(Lower zone - Sample 2A, sample

Sample 2B)

A825

9.5

Shale, blue-gray, fine grained, with

C.E. zone at top, about 10' thick

with fossil. Fossils are





4.8 Sandstone, grey to tan
 to dark brown, coarse
 high calc. content, 1-2%
 calc. content, 1-2%
 (Sample 9.1)

From core (2.5 m) in S. 10
 1/2 m, well-sorted, calc. content
 1-2% (Sample 9.2)

6.7 Sandstone, grey to tan, with
 thin siltstone layers. Calc.
 content 1-2% (Sample 9.3)
 2.7
 calc. content 1-2% (Sample 9.4)
 conc. (Sample 9.5)

0.2 Sandstone, grey to tan, with
 grey to brown calc. concretions

1.2 Sandstone, grey to tan, with
 (Sample 9.6)

3.6 Sandstone, tan, 2.5 m, 0.3
 m. Contained large
 to medium calc. concretions.

4.4 Sandstone, grey to tan, with
 thin siltstone layers. Calc.
 content 1-2% (Sample 9.7)

3.5 Sandstone, grey to tan, with
 35



[illegible]



[Faint, illegible handwriting]

101
42
50
34

125

4.7

Siltstone, light gray, clayey, locally peppered with thin, incus spars. Soft forms white clayey crust on bench. Some ss. Brown fossils + sandstone at base.

2.7

Siltstone, light gray, clayey, silty. Upper part to 10' is locally pebbly, some light gray to yellow, gray, traces of water at base. Locally bedded, some thin sandstone.

3.2

Sandstone, fine gr., light gray, may grade to clayey. No silty clay yellowing. Some minor spots.

96.0

Sandstone, medium, coarse to coarse, local up to 51 inches thick, red with some green. Dark to light gray to brown. Fine to medium, coarse gr. with some of stragglers. 1' to 3' of yellow gr. at base. 1' of water cyl, large. Some fine size clayey. qtz + sandstone at base.



5.00 5' - 6' ss. observed 4' - 5' ss.
with Lpp. - 10' + 3' ss.
to be observed 10' - 12' ss.
in clay shale 10' - 12'

3.00 3' - 4' ss. fine, 1' - 2' ss. fine,
with clay shale 1' - 2' ss. fine,
1' - 2' ss. fine, 1' - 2' ss. fine

6.5 6' - 7' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with

5.5 5' - 6' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with

2.0 2' - 3' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with

7.0 7' - 8' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with
1' - 2' ss. dk. gray, with



with plaster cut fragments
to study at base.

6.4 - claystone, sandily and arg.
micaceous, clayey throughout. No
mottling. No lamination
or wire structures and no
clay streaks.

4.2 Claystone, light gray, sandy,
fine grained, micaceous. No lamination
or streaks.

1.2 - claystone, light gray, sandy,
fine grained, micaceous. No lamination
or streaks. No clay streaks
and no clay streaks.

6.0 Claystone, light gray, sandy,
fine grained, micaceous. No lamination
or streaks.

10.6 Sandstone, gray, medium grained,
fine grained, micaceous. No lamination
or streaks.

2.6 Sandstone, medium grained, micaceous,
fine grained, micaceous. No lamination
or streaks. No clay streaks
and no clay streaks.



multiple interbeds.

14.2 Sandstone, with some thin
fossiliferous, & some
thin siltstone in lower 2

7427

0.1 Lignite, with claystone
interbeds, & some
thin siltstone in lower 2
(Sample 1)

4.6 claystone, gray, shaly, with
thin siltstone in lower 2
interbeds.

4.9 Sandstone, shaly, with
thin siltstone in lower 2
interbeds.

11.5 Sandstone, shaly, with
thin siltstone in lower 2
interbeds. Shaly, & some below and
above the unit below
5" of sandstone & siltstone
interbeds.



3.7 Crystalline, coarse, sandy, grayish
ls, with some greenish
with local brown & white.
Grey.

3.8 Sandstone, fine to medium,
crystalline, light yellowish.
6 feet to 10 feet thick
at base of section. Lower 2
or 3 feet of section
covered by 5 to 10 feet
of sandstone.

2.2 Crystalline, light yellowish,
spotted with brown.

3.9 Crystalline, sandy, medium
to fine, gray to light
yellow with some greenish
white. 10 to 15 feet thick.
Lower part, light
gray to light, greenish gray
becoming sandy at base.

2-? Sandstone with different
textures - top 5 feet or so



W-7

Old cove mine entry, .05 1/2 mile E
Aladdin, just N. of Wyo Rt 111 in
center N 1/2, SE 1/4, sec. 28 T54N, R61W

Case City in ...

Part A

33.5 S. 20° E. 100 m. 100 m. 100 m.
x-12.5, weathered but quite
hard. Local with pinkish red,
fine set to friable. Basal
60% clay. Coats of
and some Fe in over cover
silicates. N. 100 m. 100 m. 100 m.

0.5 to 2.5' Conglomerate, 30 c. diam. of
fragments, some pebbles, rounded
pieces of sandstone, thin, light
siliceous, full of small pits
characteristic, coarse granular
and pitted pebbles. Evidence
of much plant matter, none
preserved. Coarse sandstone
some fine conc. matrix clayey
fine to coarse ss.



Comm. on. el top.

S



N

15.0 Sandstone, medium, brownish
medium sand, x-bed, some
fine layers at base part.

Part B

To west along crop of 15' S above
above to next high point in ridge.

Starting at base of 15' S above,

14.0 Sandstone, medium, x-bed
and gr. weathered brown
brown, some pale yellow
in + fine structure
base part

20.0 Sandstone, fine, x-bed
some yellow weathered
light gray to gray white
Fine prop. some thin
some 5' or 10' thick
at base of local high point
thin bedded

21.0 Sandstone, medium, x-bed
to + - bedded - x-bedded. Highly
very 3' or 4' locally abundant.
Channels somewhat massive
some 10' or 12' thick



46.0 Slope covered by wash and
slump to base of 1st rd
river type ss.

Reversed contact clay out (mudstone) -
down from base of 1st Fall River

4.6 Dev. gray shale, calc. mudstone
grading to gray siltstone
(mudstone) (siltstone)
in mudstone

10.0

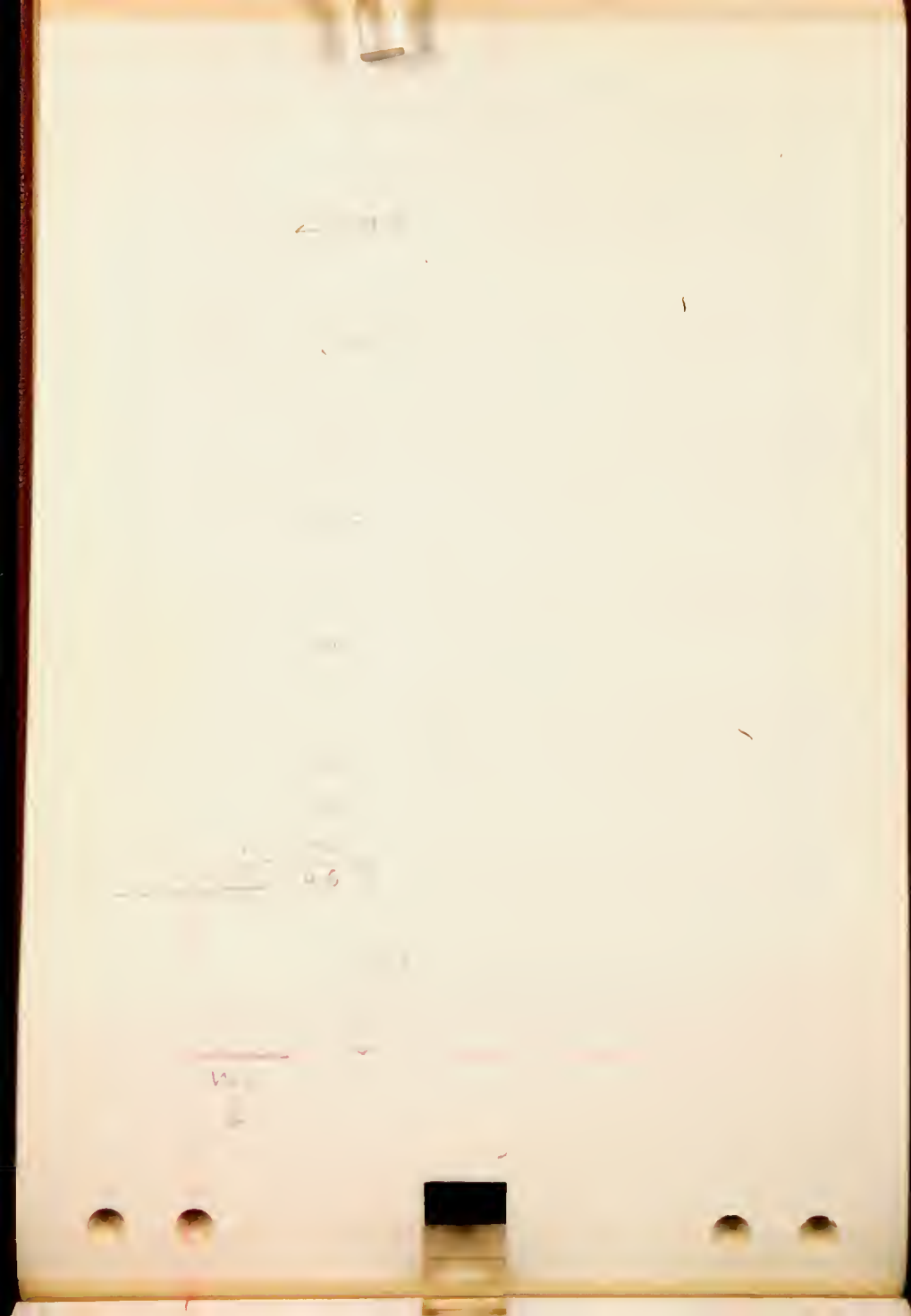
0.3 Siltstone + siltstone
light gray - 2 ft. thick

2.0 + 1.0 Siltstone + siltstone
clayey siltstone, mudstone
yellow to gray, mottled
or grayish

Measuring up slope of Fall River to
base, lower ss.

4.0 Siltstone, tabular x-bedded
fine med, gr. bit to heavy
bed, wavy, wavy, wavy, wavy
+ some vertical, long. fine med,
siltstone, commonly ripple marked

6.0 Covered Slope



3.7 sandstone, medium to coarse
~~medium~~ tan, x-lam.
weathering to yellowish brown
brown.

30. Gravel & silt

13.6 Sandstone, fine to medium grained
fairly, brownish, weathering
light gray to light yellow
and brownish brown, fine
sandy bedded.

11.4 Sandstone, massive to thin bedded
medium to coarse grained, brown
brown.

10.6 Sandstone, medium to coarse grained, sandy
brown, fine to medium bedded.

Part C

-1.0- Sandstone, medium to coarse grained, x-lam.
medium to coarse grained, brownish, weathering
fairly to 20' sandstone
not seen here for 100 ft.
below, just a few feet
above it.

Thinly bedded to medium bedded, fine to medium grained
brownish, weathering to light brown.



Locality W-8 Nicholson Ranch

On S side of local high ridge E
south of Wyo. Rt. 111 about $\frac{3}{4}$ mi W
Aladdin, NW cor. sec. 34, T. 54 N.,
R. 61 W.

Massive chert, trans. well in place,
starting at top of massive
sandstone, thin bedded, lower
chert is thin.

72.0 Sandstone, mostly massive,
coarse grained, medium grained
yellow gray to white
1-2' thick, dense, fine
grained, coarse grained
3' thick, below top of
with big chunks of soft
pink x white ss. - one of the
locally about in foot top
also a thin bedded
bed. about 3' thick
scattered chert & qtz pebbles

72.1 Sandstone zone, variable
bedded, medium to fine gr
ss with chert qtz &
gravelly, pellets ss. sandy
clay. grades into
unit above.



32.5' to 3' is 10-2' in
clayey ss. or friable
with some hard ledges
med. gr. ss. Pol. in places loc.

35.0

Sandstone, medium grained
weathered, 5-20' in upper 20'
weathers yellow grey to
clay, yellow, lower 10-15'
fine gr. bedded, beds 0.5
to 2.0 with interbeds
clay to sandy, sh. +
sandy ss. grey to light
brown, some pebbles
fine gr. clay in lower
20-3' like in lower part
locally 0.5'.

1.5

Sandy clay, greenish grey
is at brownish grey
with plant frags (including
cured leaves), basal 0.5'
is lighter shale many
plant frags, weathers
pale. much green clay
+ frags + roots.

1.0

Sandstone, clayey + micaceous
to sandy clay, plant
frags.



4.0 Sandstone, med gr, med to coarse forams, broken forams, ledar, to yellow to reddish gray, some calcareous & local thin roots in sandstone & front water.

4.0 Shale, dk gray to dk brownish gray finely silty, weathers gray to purplish gray, thin plant fragments and local thin roots, plant & animal tracks, lignite shale.

2.5 Coal (white), and shaly lignite upper 1.0+ feet considerable brown coal soft coal, lower 1.5 cherty shaly clay lignite.

1.5 Shale clay blocky, weathers light gray, platy, brown in sandy at base.

1.8 Shale, sandy, grading to shaly sandstone with thin interbedded silt. Plant fragments some recognizable as forams.



5.5 Sandstone med. gr. approx
1.0' vertically above sandstone
lower unit with sh. - l.
miller, becoming shaly at
base.

2.5 Shale dk, gray blocky,
plastic, fairly silty.

1.1 Coal lignitic

3.0 Shale ^{to blocky sh} lignitic
interbedded with coal
thin gray - black to
black to dk gray.

0.4 Sandstone med gr, fairly
gray.

1.1 Shale dk gray blocky,
fairly silty

2.6 Sandstone, fine gr, some
silt, soft massive, well
grading

1.0 Shale ss - about 1/2" thick
lignitic at base



0.2 Lignite

2.8 Sandstone, massive fine gr.
some well, weathers light
gray some yellow & brown stain
on joint faces

2.8 Shale, blocky, dk gray
loc. finely silty

1.0 Limestone or shaly limestone

11.6 Shale, blocky, dk gray
some thin, locally more
clayey fine grained
1.5 silty calc at base
14 0.3 silty clay sh.
when weathers gray.

1.3 Shale ss above

2.4 Sandstone sandy to silty tough
impure, brown, becomes
sandy at base

1.0 Sandstone, fine grained,
massive weathers yellowish
brown laminae of lg silty
sh + ss at base. Gypsiferous

7
2
—
6

2.8 Clays ss, greenish gray
gypsum zone at base

13.0 Thinly bedded, dk greenish gray
with vesicle grains &
lower beds limonite.

15.0 Chert obscured by slope wash
to chert green mud & some
limonite in flint.

11.0 Sandstone, fine, gr, yellow
weathering, thin bedded &
lamin. with some interbedded
gray silt & sand thin beds.

5.0-? Shale, silty ~~dark~~ dk
gray, with silt & sand

Washed in stream below.



W-9

Road & stream cuts along rd to Four Corners
from Wyo Rt 111, chiefly in E 1/2 NE 1/4 sec. 27
T.54 N., R.61 W., just N junction with Rt 111

1. 12. V. c. usual

2. 12. 1/2 in. x-long, rip
measured as a whole.

40.0 1/2 in. interval - Upper 1/2
starts with a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell. The
lower 1/2 is a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell.

0.5 to 1.5 1/2 in. interval - Upper 1/2
starts with a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell. The
lower 1/2 is a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell.

3.5 1/2 in. interval - Upper 1/2
starts with a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell. The
lower 1/2 is a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell.

6.2 1/2 in. interval - Upper 1/2
starts with a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell. The
lower 1/2 is a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell.

2.0 1/2 in. interval - Upper 1/2
starts with a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell. The
lower 1/2 is a thin shell
growing to a rich dark
thick red. The sediment
then a light red brown
covering the shell.



2.1 Sandstone, med. gr. yellow
weather. Thickens w/ depth
to big channel fill cutting
out most beds below.

15. Ssdy, bluish, heavy mar
of a ~~channel~~ sandstone

2.2 light gray, bluish

2.3 red + brown

2.4 yellow-green, bluish

1.5 red + brown

7.2 gray

About 30 ft below base is
thin bed sandy, clayey
below this is a thin bed
sandy.

1.3 Ss, med. gr. med. Ssdy, loc
to cement the upper 0.5
remainder is clayey silty
grading to silty sh.

5. - bl.
Gray claystone, plastic
above, with gyp xls
grading thru silty lighter
green to greenish clayey
silt.

(Sample 1 of upper part) 55



0.5, Siliceous concretions by iron
oxide in clay.

9.7 Shale dk gray clay,
some silt interbeds
in upper 3'.
Sample 2 of upper
5'.) ——— 4.0-5.0'
concretionary wash.

7.6 Sandstone, fine gr.,
massive upper 0.1-0.2'
Fossils rare. In upper
part of section. 11.5'
Sandstone, fine gr.

21.0+ Interbedded clay
shale and sandstone.
Shale dark gray, clayey,
locally, contains
interbedded silt + sand.
Sandstone in fossiliferous
locally sandy ~~shale~~
lenses up to 0.2'
thick, locally
fossiliferous, but mostly
yellowish gray shale.
Shale, fine gr., fossiliferous
darker in color?

Cenozooids brevifolia (Frost) Bell



beds in section of
of the same level
to about 4 feet

Gully comes in from east
and with terraces along
of the unit. South across
gully, top of the ss above
can be traced and below the
12 to 23 feet of the
type. The gully with
at base of terrace
1.5 feet thick section
between the terrace
level and the level of the
base of internal channel.

From top of the ss above
gully to ss

25.0 - Sandstone ss in terrace

15.0 - Sandstone ss in terrace
beds, some may be shale
thick to about 4 feet

5.7 - Sandstone ss, 100 ft
silty, in terrace, with
which goes to the bottom



is variable in thickness.

4.5 Claystone, calc. gray, loc.
silty, some gyps in
fractures. (Sample 3)

1.3 Limestone, brown, sandy,
some reddish, sh. plat.
frag. (Sample 4)

5.3 Claystone, dark gray,
becoming silty & sandy
in lower part.

0.3+ Sandstone, calc., tan, sh. plat.
with plane parting. Fairly
well sorted, some fine sand
in parting. (Sample 5)

? Sandstone, calc., tan, sh. plat.
with plane parting.



W-10

Arch Creek section. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec 14
T51N, R.66W, just off rd to Moorcroft to W
about $\frac{1}{4}$ mile before it turns W over ridge.

Part-A Begins within Fall River at top
of swell butte $\frac{1}{4}$ mi N of where
Moorcroft rd swings W up
ridge. Measuring down

10.0 S. side of, to top of (1-2 mi)
to the south of Chert. butte
to 100 ft. above. x-lam. with
ripples, mostly in bed of
small, sandy, branching. F.
thin bedded, slightly laminated S.
bed. 1-2 ft. Fine grained.

7.3 Interbedded (and interbedded)
sandstone and fine gr. ss with
parting, all shale. Chert
low section, below gray
e.g. 1-2 ft. toward top
thin bedded yellowish sandstone
Some brown to dark gray
beds, calc., and some red
plugs.

11.3 Shale, gray to dark gray with
laminar, and thin bedded



* silt throughout. Locally has
carb frags and a little iron
worked. Some Fe impregnated
red brn weath silt layers,
Some conc. Fe in silty zones.

2.2 Sandstone, fine grained, thin
beds up to 0.6, cross-bedded
breaks to platy + flinty, with
clay lenses, some partings
silty to silty clay. Locally
a grayish brown mud is
locally Fe impregnated top
unconformity surface.

2.4 Shale gray, silty with intervals
c11-c12 of silty clay, locally
concentric Fe impreg.

9.7 Sand, gray - black in upper
3 ft. black fine + silty below,
some - black fine grained
some to app. some on bedding
planes. (sample 1 is fine
2 ft - 5 ft about base.

10.2 Sand, fine to med, locally Fe impreg
cross-bedded, upper part
massive, platy, thin.



continues to peculiar fine
lumpy surfaces.

5.3 Shale, dark bluish gray,
some thin salt in top bed.
In upper 2' (Sample
2 is spot of -wood incl. 2')
L. 11 p. 11

1.5 Sandstone, fine grained, upper
0.6' containing little iron.
lower clay, friable lower
part is x-lam bed that
weathers to thin clay. breaks
in place. Craps on lower with
yellow clay to buff.

4.8 Shale, gray, much of it ~~is~~
~~is~~ weathered to a gray
weathered layer. Fine
silty, carb frags loc.
Upper 1.5 feet is dk gray, silty
with some salt in thin
beds, some Fe scale layers
in upper 2' +.

1.4 Sandstone, fine grained, tan to x-lam
weathered buff, some Fe scale
upper 0.7' is hard, lower
0.7' clayey with bluish 61



3.0

Shale, very silty in upper
1.5 grey + light grey, brown
stain. Lower 1.5 less
silty, dark grey

2.4

Sandstone, fine-grained, + silty
irreg. inter. lam with dk
grey shale, locally
just mixed with clay.
Some inter. beds sandy
shale with carb frags.
Unit Fe + yellow stain,
silty, few pebbles to
rounded sandstone pebbles -
siltstone, shale, sand-
stone.

1.0-2.0

Sandstone, fine-grained, cross lam
in D. 1.5 to 0.5' bands,
rippled, weathered. Cap. in large,
unit Fe stain.

3.0

Sandstone, massive,
fine grained, silty, grey
laterally to siltstone
locally buff.

1.5

Siltstone, sandy + silty
irreg. inter. lam, sand-
stone laminae.



- 0.7 Shale, gray silty.
- 11.2 Sandstone, fine gr., in thin beds with shaly partings. Fractured.
- 0.3 Shale, black fissile
- 6.3 Sandstone, fine gr., red thin bedded, somewhat locally some more massive beds. No trace of buff. Soft green, locally hardening to Fe about 3' from top. Some shaly partings. Fossils showing trace of V in lower part of bed.
- 4.0 Sandstone, fine gr., thin bedded, silty, becoming silty thin bedded & becoming silty. Gradation to interbedded & interbedded. Shale & silty 1.5 to 2.0' from top, and this into silty dk gray shale in lower part.



Part B - Starting at base of belt
and measuring up to join Part
A.

For blue approx. 16 feet (horizontal)
above top of basal unit (Part C),
this interval characteristically
weak.

18.2 Claystone sandy, conglomeratic
with lenses clayey, light
sandstone.

Lower 3
lenses sandy,
conglomeratic
with gray
sandstone

Lower 3 observed in deep
wash, is vivid orange to
greenish yellow color -
capped locally by dk
gray sandstone to siltstone
conglomeratic.

Above this is a thin
qtz. greenish gray clay
sandy. About 6 ft from
base sandy green clayey
extends upward 5 ft
is succeeded by about 3
yellowish gray sandy clay
above this upper 1 ft
of gray clayey sandstone



Some very local sandstone in the zone given above

of some types.

0.3-0.4 30m of coarse sandy clay, probably more abundant. A number of plinthis large pebbles found in places here. Color, 2, is yellowish stained with some light gray matrix. Seams to be sandstone on unit above given as is that below.

7.5 Clayey, sandy, is sandier at base, with calcareous, and the upper 2 feet, but mainly part sandstone. Seams of thin sandstone layers gray with greenish and

3.0 Sandstone, soft, gray, clayey at base, with clastic and greenish matrix of silt and scattered crust of irregular gray white



Locally, some
fine to medium
siltstone
Cyl layer

Some of the
fine to medium
siltstone

8.0

Sandstone, fine to medium
with coarse granules.
At base is thin coarsening
quite layer resting on
on surface of unit above
with a brown sand with
some clay and some
scattered granules. Layer
is about 1 foot thick
base of unit is marked
in clay and sand.

2.3

Claystone, dark gray, with
a thin sand layer at base
Sand of unit above.

1.0+

Claystone, light gray, sand
fine, silty (basal or
Sample 3)

4.0

Siltstone, even, medium
with light gray, granular
fine. Some siltstone
in all above. 1.0, with
coarse clay granules
some siltstone (Top of
Sample 3 is basal foot)



5.3 Claystone, hard, dk gray ^{to black} silty,
locally in argilla silt, has
scattered coarse grains of
qtz. + possibly little
pieces of fossiliferous loc.

2.6 Claystone, gray to dk gray
soft

1.2 Siltstone, hard light gray to
gray, clayey, and silty claystone

4.5 Claystone, gray to dk gray in
lower 2.5', black,
possibly sandstone in
upper 2.5'.

5.3 Sandstone, light gray, weathers
yellowish to olive gray.

3.6 Sandstone, fine gray to
black, x-lam, in places.
In thin beds interbedded
w. fine light gray shale.
Some ripple marks seen
trails on beds, w. thin
light gray or yellow shale.



Sample 7 of
upper 2 ft.

5.3 Claystone and shale, about
1.5 soft waxy, poss
lenticular sh. at base
light grayish green. Glns
upward to bleary sh,
locally claystone, gray
with greenish cast.

Sample 6 of
center red zone

4.9 Claystone, soft below, hard
hard upward. Greenish
above + below, brick red
color changes. Mottled
dark red brown + green
green in lower part, 1-2
ft. 2-3 in. center. Red
brown + red. Shale
pos. waxy, red part
+ greenish. The red
harder than the green.

Sample 5 of upper
2 ft.

3.8 Claystone, gray, hard below
greenish upward into
soft waxy claystone
(Sample 4 of upper 2')

★ →

3.5

Siltstone, clayey, and silty
claystone, hard. In sharp
contact with underlying
unit. Dk gray to black. 68



with ~~common~~ plant fragments

- 6.0 Siltstone, med, gray, plant fragments, interbedded with clay + into bands with clay siltstone out at gray silt shale ~~unit~~
Locally forms coarsely bedded gray white to yellow gray buff siltst. Shale, med to up to 0.7, fine clay white, brown

Joining 1201 with member of part A.

Part c - Siltstone, outcrop down lower slope. Part B begins 10' above top of the

- 10.6 Siltstone, med, fine, interbedded with clay, fragments of plants + small, med bedded
23.5 Claystone, variegated, clay fragments, med bedded



About 10-13' from base is
variegated red + green
strata. Basal 10' completely
observed. ~~Basal 10' completely~~

18.0 Sandstone, weathered to tan,
conglomeratic, with coarse,
chert glauconitic pebbles. Some
large, greenish-brown pebbles
visible. No - but pebbles.

Part D. Outcrops across Fall River
road, quarry in cut across
road

Laterally, massive, fine-grained
micaceous sandstone SS,
locally tabular & laminar in
lower part, coarse
in upper. Shale in
place of fine SS
capping white (fossiliferous)
in part A. Thickness
variable, locally 15-25'

Upper. Sandstone, reddish
about 6'± to top of
liquefied sandstone
structure of part D observed. 76



complete ch. ev. sch. n

In ditch cut on up road is
Felt River - S. C. Co. 1.
About 1/2' below it in shell
Crust 19.8 zone it. S.C.
is present in little smaller
includes some lower
cones. locally.

59
14
212
C
121

2.5

話

2



size gray chert (not polished) as
all the cherts clear out

16.02 Coarse material, for
black sand - not polished
gravel size

6.2 Small gray sand - not polished

25.5 With small slugs basal 15.0 +
concentric, not polished, upper 10.0
fine gray chert, not polished
in dust, gravel + small for
size. Not polished. polished
piece - In dust + gravel
not polished

14.0 Chert in chert gravel
few gravel chert, upper 10.0
0.6 ± chert with chert
not polished with flat
poly. chert - some not
gravel - In dust + gravel
not polished piece
in dust + gravel

2.5 Chert area is polished
gray sandy

6.8 Chert area dark for
gray with chert












4.5

5

401

1.

2.

1.  /  /  /  /  /  /  /  /  / /

Inyan Kara Creek section north by R. L. ...
 100-120 (W-12)

- | | |
|-----|-------------------------|
| 20 | Reddish-brown sandstone |
| 3 | Sandstone |
| 1 | Shale |
| 2.5 | Sandy limestone |
| 3 | Flintstone |
| 3 | Flintstone |
| 50 | Claystone |
| 11 | Is. + clay |
| 67 | Claystone |
| 7 | Sandstone |
| 42 | Claystone |
| 29 | Sandstone |
| 21 | Claystone |
| 11 | Shale |

252
 120
 77
 7

1072
 100
 200

14170
 7210

200
 117
 152
 7
 100
 200

107-147

841 -

133 -

107 -

100 -

163 -

100

177

131

100 -

219 -

240



